Re: Prostate Cancer Detection with Magnetic Resonance-ultrasound Fusion Biopsy: The Role of Systematic and Targeted Biopsies

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RE: Prostate Cancer Detection With Magnetic Resonance- Ultrasound Fusion Biopsy: The Role of Systematic and Targeted Biopsies

Filson CP, Natarajan S, Margolis DJA, et al.

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Expert's summary:

Filson et al. performed a prospective trial comparing targeted and systematic prostate biopsies performed with a multiparametric magnetic resonance imaging (mpMRI)-ultrasound-guided fusion biopsy system (Artemis, Eigen, Grass Valley, USA). A total of 1042 men underwent mpMRI imaging followed by a fusion image-guided 12-core systematic biopsy. Men with suspicious lesions on mpMRI underwent additional targeted biopsies. A normal mpMRI was found in 217 patients (21%) with 35 (16%) of them being diagnosed with a clinically significant (cs) prostate cancer (PCa) (e.g. Gleason score [GS] >=7) detected by systematic biopsy only. Among 825 patients with a positive mpMRI a combination of targeted and systematic biopsy identified 289 cases of csPCa. Adding systematic biopsy to targeted biopsy resulted in 60 (7%) additional csPCa diagnoses, 15 (2%) additional high-risk (e.g. GS of >=8) PCa cases, and 73 (9%) additional GS 6 cases that would have otherwise been undiagnosed if only mpMRI detected lesions were targeted. Thus, the number needed to biopsy with the combined approach to identify 1 additional case of csPCa was 14.

Expert's Opinion: Systematic transrectal ultrasound guided free-hand biopsy of the prostate has been the standard diagnostic tool in men suspected of PCa. The introduction of mpMRI now allows imaging-based detection and localization of tumours in the prostate. In a recent systematic review and meta-analysis, a targeted biopsy of such a lesion showed a higher rate of detection of csPCa compared with conventional systematic transrectal ultrasound guided free-hand biopsies[1]. However, the significance and extent of combined systematic biopsies remains controversial.
Siddiqui et al. detected after adding systematic to targeted biopsy in their cohort of 1003 patients with a positive mpMRI 29 (2.9%) additional csPCa cases [2]. That resulted in the significantly higher number of 35 patients needed to be biopsied additionally with the systematic approach to detect one csPCa case. The authors of the study performed a 12 core transrectal ultrasound guided free-hand biopsy. Consequently, the significantly lower performance of the systematic biopsy should have been anticipated. A more extended biopsy approach was followed by Radtke et al.[3]; in their study a transperineal template saturation biopsy (median 24 cores) was combined with MRI-ultrasound fusion guided targeted biopsy and lead to detection of 11 (7%) additional cases of csPCa (a total of 153 patients with a PIRADS score >=3). A PIRADS score of <3 on mpMRI was present in 141 patients (48%) with 17 (12%) of them being diagnosed with a csPCa detected by systematic biopsy. Three important conclusions can be drawn from the present and the two cited prospective studies: First, a meaningful number of patients with negative mpMRI harboured csPCa which were only diagnosed by a systematic biopsy. Second, targeted biopsy alone would

miss a relevant number of cs tumours and therefore should be combined with a systematic biopsy technique. And third, systematic biopsies should be performed either transperineally using a template grid or transrectally using an image-guidance system in order to ensure optimal spacing and maximal coverage of the gland. The number of additional cores should be based on the size of the gland and is still under debate.

Unlike in many other solid tumors for which imaging and targeted biopsy is common, high false-negative rates or misgrading of the tumour through transrectal ultrasound guided free-hand biopsies has been a widely accepted issue for urologists for many years. Some of them still argue that a more extensive biopsy technique bears the risk of over detection of indolent tumours. However, since more than 50 years urologists are trying to answer the question, which patient should be treated and which therapeutic modality should be offered, using studies which are based on a diagnostic procedure with a low accuracy and reliability. With the introduction of active surveillance, focal / brachy / radio therapy and radical prostatectomy with nerve-sparing techniques, we owe our patients the best diagnostic evaluation technically possible and available. We should avoid repeating the mistakes of the past by compromising the diagnostic accuracy in favour of theoretical considerations of over detection or economic issues.

Conflicts of interest
The author has nothing to disclose.

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